EVIDENCE AGAINST HAPTEN SPECIFICITY OF IgE ANTIBODIES TO ISOCYANATE PROTEIN CONJUGATES

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Reaginic antibodies have been detected in the serum of some TDI reactive workers by radioallergosorbent testing (RAST) with p-tolyl(mono)-isocyanate (TMI) conjugated to human serum albumin (HSA), leading to the proposal that TDI asthma may be IgE mediated. Studies from our laboratory and others have shown TMI-HSA specific IgE antibodies in sera of only a small proportion of workers, proven reactive by provocative inhalation challenge. Further, sera from a small percentage of asymptomatic workers also have TMI-HSA specific IgE antibodies.

Using a panel of 5 TMI-HSA RAST positive sera, we have shown cross-reactivity with methylene bisphenyl diisocyanate (MDI), hexamethylene diisocyanate (HDI), xylene diisocyanate (XDI), and monomeric and trimeric isophorone diisocyanate (IPDI) conjugated to HSA. Inhibition studies with these conjugates indicated lack of hapten specificity, raising the possibility that the antibodies might be carrier specific. RAST using TMI, MDI, HDI and XDI conjugated to non-human protein carriers were negative, supporting this hypothesis. Further evidence for carrier specificity was obtained by positive RAST results with HSA-conjugated to acetic anhydride which, like isocyanates, is thought to react with epsilon amino groups of lysine.

These results suggest that inhalation of isocyanate vapors may cause in vivo modification of human proteins which might, in certain individuals, confer antigenicity. This may play an important role in the disease pathogenesis.

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